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From: Crosby, Michael
Sent: Friday, April 15, 2016 9:23 AM
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Cc: Carter, Lonnie; Baxley, Mike; Pelcher, Steve; Cherry, Marion; Cherry Marion
Subject: VCS - Privileged and Confidential
Attachments: 2016 04 15 - Santee Review of Bechtel Report (2).pdf; 2016 04 07 - SCE&G List.pdf

Jeff,

Marion and I have reviewed the SCE&G List received in our meeting Thursday, April 7, 2016. The SCE&G List provided a list of Bechtel recommendations and other Project issues compiled by Al Bynum including SCE&G staff comments on each item.

In an effort to be responsive to Kevin's suggestion received in the meeting on Monday, March 7th, we have prepared a document which identifies the key issues raised by Bechtel in the assessment. We have provided some general notes on each section of our review which provides guidance from Santee Cooper, and also ties back to the draft recommendations we forwarded to SCE&G on March 3, 2016.

We look forward to discussing at your convenience.

Thanks,
Michael

Santee Cooper - review of SCE&G's List ... cross-referenced to ... the Bechtel Assessment Report			
April 15, 2016			
SCE&G Item Number	Bechtel Item Number	Key Issue(s) raised by Bechtel	Santee Cooper Comments
	PM1	Project Management: Lack of consortium project management integration and accuracy of reporting. Owners management approach does not allow real-time mitigation influence on schedule and cost and needs to be supplemented with experienced EPC management support.	1. Agree in general - which in part formed the basis of Santee Coopers's Draft Recommendations dated March 3, 2016.
	PM2	Commercial issues: WEC-CB&I relationship strained.	1. No longer applicable.
20	PM3	Project morale: Low overall morale on the project.	1. Anticipate issue will correct over time as Fluor programs install.
	PM4	Commercial motivation: Commercial conditions not aligned with project goals.	1. Awareness issue - worth monitoring. 2. Vertical alignment of Consortium under WEC makes commercial visibility difficult. 3. With Oct 2015 Amendment, WEC holds the purse-strings for entire project - and could impede Fluor productivity if money does not flow properly going forward.
21	E1	Engineering design debt and change paper: Incomplete design, constructibility issues, significant number of design changes.	E1 - E16, General Notes: 1. This section contains much overlap and repetition identifying a few fundamental issues highlighted in red - engineering debt, constructability, change paper, emergent issue management, and work packages. 2. These fundamental red issues have impeded the Project for a long time and formed the basis for Santee Cooper's Recommendation No. 5 (engineering section). 3. Bechtel's actual recommendations for each of these items should be considered; however, outside EPC expertise should be brought on board to perform a deep dive on each red issue, recommend best practice solutions, and monitor progress going forward.
22	E2	Engineering design, change paper and work packages: Change paper not yet incorporated into parent documents creating complex and voluminous work packages, inefficient document control process	
23	E3	Engineering design and change paper: Excessive changes to existing drawing revisions, drawing revision requirements not being met	
24	E4	Engineering design impact on constructability: Inadequate coordination between construction, field engineering, and design engineering, late N&Ds	
25	E5	Engineering design debt and 3D model: Incomplete electrical design, complex pipe support design, lack of use of Standard Plant 3D Model.	
26	E6	Significant specific problem areas being worked: Chilled water system, turbine drain and vents, Annex Bldg reinforcing steel, main steam piping.	
27	E7	Engineering design, change paper - effect on work packages and construction: Lack of identification of design changes well in advance of construction	
3	E8	Engineering design debt: Incomplete electrical and civil design above 100' elev in Aux Bldg	
28	E9	Engineering design debt, emergent engineering issues: Engineering debt, emergent engineering issues, adequate resources for post-engineering design closure	
29	E10	Engineering design debt and change paper - effect on construction: Incomplete engineering and lack of timely E&DCR incorporation in advance of construction	
	E11	Bechtel commentary on SCE&G interviews: No specific recommendation from Bechtel	
30	E12	Engineering design debt and change paper - effect on structural and mechanical modules.	
4	E13	Engineering design debt - effect on procurement and construction: Incomplete design - significant number of drawing holds impeding procurement and construction activities	
5	E14	Engineering design debt, emergent issues and post-engineering closure: Do adequate resources exist.	
	E15	Document control and craft work package handling: Inefficient document control/work package process	
6	E16	Document control and work package administration: Inefficient work control process	

31	P1	Material storage management: Lack of communication between Charlotte Procurement and site regarding material deliveries - impacts project due to storage limitations on site	P1 - P17, General Notes: 1. Again, this section contains overlap and repetition identifying a few fundamental issues highlighted in red. 2. On the red issues identified, we defer to Alan Torres & staff for determining the impact of these issues on the Project and how best to staff and solve. 3. We anticipate with Fluor taking over Bulk Commodity Procurement, at least some of these red issues will correct over time. 4. Beyond these specific red issues, Santee Cooper's recommendation No. 5 (procurement section) recommended outside EPC expertise to help gain clear visibility of ALL PROJECT PROCUREMENT issues, analyze supply-chain performance, and make recommendations that would best influence delivery of ALL MATERIAL BY SCHEDULED NEED DATES ... which is another general problem that has impeded the Project for years.
7	P2	Material storage management: Insufficient storage space on site for Level C and D storage	
32	P3	Material storage management: Inefficient disposition of material impacting storage space	
33	P4	Material storage management: Inefficient organization of stored materials.	
34	P5	Material storage management: Lack of knowledge of on-hand material affecting construction planning	
35	P6	Material storage management: Ineffective material tagging, problematic material identification and location	
36	P7	Material storage management: Lack of robust material storage/preventative maintenance program	
37	P8	Inventory management: Material management min/max system not fully developed	
38	P9	Procurement / construction integration: Inadequate planning and coordination for material requests/withdrawals	
39	P10	Critical Path Procurement: Module suppliers inability to meet construction need dates	
40	P11	Supplier quality: Supplier compliance with project and purchase order requirements	
8	P12	Procurement administration: Procurement management and closure of risk items	
41	P13	Procurement administration: Adequate procurement resources, inefficient change management	
42	P14	Procurement administration: Communication of commercial grade dedication requirements to suppliers	
43	P15	Procurement administration: Inefficient system for tracking requisitions/purchase orders by work package	
44	P16	Procurement / construction integration: Clear visibility as to what commodity/equipment requires a mitigation plan for schedule adherence	
45	P17	Procurement / construction integration: Planning and issuance of work packages out of sync with procurement cycle	
46	CPC1	Construction management of site module work: Increased module fabrication scope on site - work needs to be planned and tracked	CPC1 - CPC37, General Notes: 1. Santee Cooper believes that Fluor is in the process of addressing many of the red issues in this section; however, the Owners' staff would benefit from the addition of outside EPC project controls expertise to validate Fluor and WEC's work going forward. 2. Beyond the red issues listed, Santee Cooper's Recommendation No. 5 (construction, project schedule, project metrics) - recommended outside EPC project controls expertise to independently review and assess the achievability of the Project Schedule once validated by Fluor and WEC (same to be received at the end of the year) and to independently monitor and validate progress against the validated schedule going forward.
9	CPC2	Construction planning: Work planning - Structural module work in MAB vs. in the field - Work in the field more difficult and costly	
47	CPC3	Construction management: Improper focus of POD with respect to construction planning	
48	CPC4	Construction management: Inefficient field material requisition process	
58	CPC5	Construction planning: Unrealistic unit rates for the bulk commodity installations	
49	CPC6	Construction management: material requiring rework delivered to the workface	
59	CPC7	Construction management: Excessive indirect costs on project - e.g., high ratio of indirect to direct craft	
60	CPC8	Construction management: Significant non-manual labor turnover	

50	CPC9	Construction management: Resolution of critical issues impacting schedule	
51	CPC10	Craft labor staffing: Ability to hire and train adequate number of skilled craftsmen	
52	CPC11	Craft labor staffing: aging workforce impacting productivity	
53	CPC12	Construction quality control: Effective placement of self-consolidating concrete	
61	CPC13	Construction management: Excessive craft labor hours	
10	CPC14	Construction planning: Unrealistic assumptions when scheduling construction work (too optimistic)	
11	CPC15	Project management: Focus on schedule, but not at the expense of project cost	
62	CPC16	Craft labor staffing: Inadequate craft/staffing for available work fronts	
54	CPC17	Engineering design and constructability: Complex raceway, and electrical hanger design that will likely lead to interferences and delays	
12	CPC18	Engineering design and change paper: Numerous design changes and clarifications negatively impacting scheduled work	
63	CPC19	Craft labor staffing: Apparent inadequate craft staffing toward latter part of project (no craft 9 months prior to commercial operation to close out punchlist items)	
55	CPC20	Engineering design and constructability: Tight installation tolerances leading to interference issues and creating difficulty with commodity installations	
64	CPC21	Construction management: Overly detailed and complicated safety meeting tailgate write-ups	
56	CPC22	Document control and craft work package handling: Inefficient work package/document control process	
65	CPC23	Construction planning: Apparent insufficient time allowed for installation of bulk commodities in an efficient manner (not enough time between civil, piping, and electrical)	
66	CPC24	Construction management: Craft productivity inadequate to meet schedule	
67	CPC25	Project management and integration: Potentially unrealistic schedule constraints impacting substantial completion dates	
68	CPC26	Project planning: Unrealistic schedule baseline forecast (based on PF at 1.15)	
	CPC27	Project controls staff: Improper owner project controls staff	
13	CPC28	Project controls and metrics: Consortium reports not detailed enough to validate performance	
14	CPC29	Project controls and metrics: Consortium reporting focuses on short-term windows and not total project	
15	CPC30	Project controls and metrics: Some consortium reports lack baseline and forecast information	
16	CPC31	Project controls: Potential improper cross charging across target and firm price work	
69	CPC32	Project management and integration: No schedule contingency within integrated project schedule	
17	CPC33	Project controls and metrics: Underground and above ground bulk piping installation curves tracked on same chart leading to misleading sustained rates	
70	CPC34	Project controls and metrics: Failure to use standard "S" bulk commodity curves leading to misleading sustained rates when attempting to validate schedule duration viability	
71	CPC35	Construction planning: Overly aggressive bulk commodity installation curves	
57	CPC36	Construction planning: Potentially unrealistic quantities of above ground conduit and total quantity for cable	
72	CPC37	Project management and integration: Consortium integrated project schedule is too large and complex and lacks pertinent tracking information	
18	S1	Test program staffing: Current ITP staffing heavy tech staff, operations, and maintenance staff participation	S1 - S5, General Notes: 1. These red issues should ALL be scrutinized upon receipt of the Fluor / WEC validated schedule - some red issues could possibly be resolved with Fluor's influence on the validated schedule. 2. Beyond that, we defer to Ron Jones and staff to analyze ALL remaining red issues and to plan and staff solutions for each.
19	S2	Project management and integration: Current schedule lag between U2 and U3 HFTs is significantly shorter than previous dual unit nuclear sites - drives test staff levels high	
	S3	Project management and integration: Excessive duration of turnover period to component test group	
73	S4	Project management and integration: Construction completion of bulk commodities does not align with timing of BIP turnovers	
	S5	Test program management: Good overall ITP organization and program	

Additional SCE&G recommendations Included in this review		
1	Follow-up on the escrow of IP materials	Agree with all SCE&G recommendations this section.
2	Review bond status and when we can insist on more coverage	
74	Provide data and documents to support the Owner's program development for system turnover and operations. (WEC)	
75	Provide Electromagnetic Capability (EMC) with protection and safety monitoring system. (WEC)	
76	Provide onsite automation support to Owner during post initial core load. (WEC)	
77	Provide Plant Security System (SES) testing. (WEC)	
78	Provide Cyber Security for all site specific systems to include connections between the MET Tower and Control Room. (WEC)	
79	Resolve documentation inconsistencies among the main step-up transformers, reserve auxiliary transformers and unit auxiliary transformers. (WEC)	
80	Produce a project schedule plan to achieve construction completion of at least 3% per month. (WEC & Fluor)	
81	Take necessary action to resolve the storage and preventive maintenance via the CAP – reference NND-16-0077. (WEC & Fluor)	

1. Follow-up on the escrow of IP materials

We are attempting to schedule a meeting with WEC to discuss. They agree on their obligation, and we acknowledge that the EPC Agreement requires us to pay the cost. However, we are concerned that they are going to assign an unreasonable cost

2. Review bond status and when we can insist on more coverage

We have a draft bond form from WEC. We (including Santee Cooper counsel) reviewed it with outside counsel on March 14 and provided a redlined draft to the Consortium on March 15

3. Emphasize the need to get electrical and civil designs completed and associated drawings issued as soon as possible to construction/procurement. Encourage a constructability review meeting with construction prior to issue in order to avoid the need for changes.

We agree with the comment, although we believe that it is the responsibility of the Consortium. The comment should be shared with WEC

4. As part of the weekly schedule update meeting, review near term holds and commit to getting a release date for hold removal and document issue to support procurement and construction work.

We agree with the comment, although we believe that it is the responsibility of the Consortium. The comment should be shared with WEC. A specific comment from the team is that "Commitments for release dates and accountability discussions during meetings are well and good. However, the challenge has been over the course of the project to meet commitment date for which the Consortium has not been successful. WEC needs to assess the process for removing drawing holds that impede procurement and construction activities and improve the process."

5. Continue with the weekly schedule review meetings to ensure these engineering activities are getting completed in addition to supporting emergent site issues and completing any unfinished to-go design engineering. Assemble a team of subject matter experts to develop the work scope, schedule activities, and resource requirements for Post-Engineering Design Closure. This will enable determination of the need to add resources later in the project or to reassign personnel to support these work activities.

We agree with the comment, although one member of the team notes that "The observation appears to identify a concern that the WEC engineering schedule and Post-Engineering Design Closure Plan do not address the support for day-to-day construction work but rather longer term start-up activities. Certainly, WEC engineering support for start-up activities needs to be planned and resource loaded. Efficient processes for this support also needs to be put in place. However the immediate need for WEC engineering support is to support the construction efforts – the craft team in the field trying to get the work done. Weekly schedule meetings will help, but the key is having an efficient engineering work process to provide timely support to the craft. WEC is responsible for making this happen per the Contract."

6. Continue the cross functional team identified by

We agree with the comment, although one member of

the Consortium that is tasked to review the work control process (including document control) and include consideration of the following items:

- Reducing the volume of paper in work packages
- Minimizing worker entries to those absolutely necessary to document work performed
- Implementing alternative means of making worker entries (electronic tools)
- Performing field assessments of work package activities to include worker/foreman feedback/suggestions
- Eliminating documentation not specifically needed in the field for workers to perform work
- Developing work packages for smaller, more discrete work scope.

7. Complete a needs analysis to identify and finalize the required space. Perform a comprehensive manufacturing schedule review against construction need dates and deliveries forecasted for the next 6 months. Work with the supply chain as appropriate to delay manufacture to allow for future shipment at the appropriate time. Prioritize issues with Level C storage requirements.

8. Hold procurement accountable to close risk items as scheduled.

9. A detailed evaluation of the to-go work should be performed so that management understands the

the team notes that "The key to improving this effort is streamlined work packages as discussed earlier. Also, the document control work process needs to be analyzed from a productivity perspective to remove obstacles and streamline the process itself. Productivity studies via observations in the field would be very beneficial to assess craft time and obstacles they are encountering. Throwing more resources at the problem to include additional document control personnel or OT does not necessarily resolve the issue. This is WEC's responsibility to address per the Contract. WEC is at risk for schedule delays. WEC is also at risk for the additional dollars if we exercise the fixed option." Another comment: "SCE&G PMO will be performing self-assessment of new WP implementation in 2016, on NND Assessment schedule already

We agree with the comment, although one member of the team notes that "Storage space for material and equipment has been significantly challenged primarily due to the impact of late module fabrication and delivery impact on the project schedule. SCE&G has provided laydown storage area space within the site boundary but has always taken the position that additional laydown areas needed by the Consortium outside the site boundary are attributed to module delay impact on the schedule and associated costs are the responsibility of the Consortium. This issue was listed on exhibit A of the October 2015 Agreement and considered resolved. The observations and recommendations above are the responsibility of WEC to resolve as necessary to comply with the Contract and October 2015 Agreement."

We agree with the comment, although one member of the team notes that "WEC, working with Fluor, has the responsibility to implement an effective risk management program to include the establishment and implementation of risk mitigation plans primarily aimed at meeting the project schedule. Vender supply and oversight have been an issue with CB&I. WEC, working with Fluor, is obligated to make efforts to improve the process per the Contract."

We agree with the comment. Two comments from our team: "Work on structural modules in the Modular

cost and schedule impacts before deciding to install something out of sequence.

Assembly Building (MAB) should be more efficient since the work is being performed in a controlled environment. Deferred work for CA20 had to be scheduled after CA20 was set on the Nuclear Island due to schedule delays. Also, CA20 had to be reworked to an extent due to some warping of steel components during the lifting and setting of CA20. It would benefit WEC to perform as much module work as it can inside controlled work environment in an effort to minimize deferred work. This is WEC's responsibility per the Contract." Second comment: "Work was performed out of sequence to support fictitious milestone completion of 'Setting CA20 Module', knowing that a significant effort was required to complete the module. Because of the Target Price nature of most field work (outside of the MAB), this was not a problem for the contractor and in fact, he was incentivized to move this work out of the MAB. All future moves from MAB to field should be properly evaluated for total project impact, regardless of milestone status. The Fixed Price Option will remove incentives for work outside of MAB."

10. Work activities should be planned based on a realistic evaluation of the work, rather than optimistic projections due to schedule pressure from management. This way, craftsmen will be working productively. The project should consider a rule that the placement must be signed-off, except for final clean up, the day before the placement

We agree with the comment. Two comments from our team: "Project scheduling is primarily based on the performance of the work crews performing the work and the performance of the supporting organizations such as engineering, procurement, quality control and document control. It is essential that Fluor as subcontractor to WEC and WEC have a good handle on all of the Also, it is recommended that an evaluation be performed to consider the use of subcontract personnel (at lower labor cost) for the purpose of constructing and maintaining temporary site facilities. The other comment: "Contractor needs to resource load the schedule based on reasonable unit rates and set performance goals and schedules based on the realistic information. Overly aggressive and optimistic schedule dates are not the best way to encourage craft labor performance. This has been demonstrated by the repeated failure of the contractor to meet published schedule dates for project milestones."

11. Maintain the schedule focus, but not at the expense of project cost. When engineering issues arise, adjust the schedule accordingly, so the craftsmen still feel they have some control and

We agree with the comment. Two comments from our team: "There are many reasons why the schedule continues to slip. It is essential that the work processes in each of the direct and indirect work areas

responsibility for working the schedule within budget.

12. Ensure that the design organization recognizes the importance of design changes and clarifications and is staffed to address them immediately. The negative impacts to the project will not decrease as long as changes continue and clarifications are slow to come from engineering and will continue throughout the project unless a change is made.
13. Where contractually possible, the Owners should request the data that creates the reports not just the reports. The recommended Project Controls team would then analyze the data rather than just reviewing the report.
14. Request all reports provided by the Consortium for the monthly meetings contain the overall view regardless of topic. Breakouts are acceptable and sometimes needed, but overall focus must remain on the overall project performance.

be evaluated at the grass roots level in order to get a good handle on the obstacles interfering with the work. It's convenient to cite a design change as a reason for schedule and put forth an edict to minimize design changes. But why are the design changes occurring and what obstacles buried in the engineering work processes are causing the changes and subsequent delays. These questions apply to all of the work processes involved. WEC is responsible for addressing these inefficient issues that impact work and schedule per the Contract." Second comment: "Contractor needs to resource load the schedule based on reasonable unit rates and set performance goals and schedules based on the realistic information. Overly aggressive and optimistic schedule dates are not the best way to encourage craft labor performance. This has been demonstrated by the repeated failure of the contractor to meet published schedule dates for project milestones."

We agree that this is a good recommendation and should be shared with the Consortium

We agree with the comment. Two comments from our team: "Our B&F team has been receiving performance data on target work from CB&I and is having discussions with WEC to continue receiving data for our evaluation. We plan to work closely with NND PMO in evaluating this data and the performance of the site work." Second comment: "Owner should request appropriate data and perform an independent analysis and verification of the Contractor data."

We agree with the comment and would add that we have been advocating for a format change. One specific comment: ". The Contractor has continually modified metrics and graphs to obscure the poor performance. Baselines have been repeatedly set and then re-set at a later date, thus making any performance measurement impossible. We should be looking at total project data instead of short term 9-12 months."

15. Request all reports provided to the Owners include both baseline information and a current forecast if different than the baseline. If the current forecast is later than the baseline, the Consortium should provide a recovery forecast plan. If cost is being discussed and the cost forecast exceeds the baseline, an estimate at completion should be required.
16. Request staffing plans by position which account for the total project baseline budget for the tracking of job hours. For the tracking of material type budgets, such as equipment or small tools, a baseline monthly usage plan should also be submitted for baseline tracking purposes. This document would serve as the basis for future negotiations and would provide enough detail for scope increase discussions and also validation of current actual charges.
17. Separate the curves and track all underground quantities separate from above-ground quantities. Also, after creating separated curves, compare the current installation plan to historicals to validate their viability.
18. Be diligent with dedication of these resources to support the ITP. The hands-on experience acquired through participation in the test program is important to good performance during the early days of plant initial operation.
19. Evaluate the likelihood of realizing an 8 month lag between Units 2 & 3. If realistic, ensure mitigations have been planned in case of events on one of the units while the other is in the vulnerable position of still in the testing phase. If not realistic, consider historical lags closer to 12 to 18 months.
20. We need to push WEC to better recognize successes on the project

We have the same comments from the previous item

Although this comment is largely mooted if we select the fixed price option. One comment: "We have been reviewing invoices for improper charging from the beginning of the project and have robust controls in place to include the review of data in the recommendation. We have identified numerous invoice inconsistencies that we have disputed per the Contract to including holding payment. We reached resolution on these disputes via the October 2015 Agreement"

We agree that this is a good recommendation that should be passed along to the Consortium.

We agree with the recommendation. One comment: "The NND Operations Readiness and Engineering organizations plan to be heavily involved in the ITP"

Two comments: "WEC and its contractor Fluor are re-evaluating the start-up schedule and determining the necessary mitigations. WEC is responsible for the start-up schedule for both Units per the Contract." Second comment: "Need to evaluate the ITP schedule and resources. Also, mitigations and contingencies should be investigated. 18 month separation will not support completion date requirements."

Three comments. First: "Fluor management (Hawkins, Loburk) and WEC (Churchman) agree. This is already happening in POD on a regular basis. Specific example is NI2 F1 wedge pour and bringing in 2 Construction superintendents to thank them and congratulate their team." Second: "I agree that this is WEC's responsibility, with the help of Fluor as its

subcontractor, to motivate the work force and reward individuals appropriately. One significant area in which progress can be monitored is through the accomplishment of specific work activities by the construction crews and Field Non-manual support personnel. The criteria for performance should be personnel safety, quality and production via the earned hour and performance factor measuring system in an effort to meet schedule. With the proper training and attention to detail, the construction crew leader can track the crew's performance and WEC/Fluor management can recognize the successes as appropriate. This type of recognition would be meaningful. I understand that the WEC and Fluor management is already taking steps to reward concrete placement success at the Plan of the Day (POD) meetings. More importantly, Fluor as a subcontractor to WEC under the October 2015 Agreement, has more experience in managing a construction project and, with the help of WEC, should stabilize the work environment and greatly improve the morale on the job site." Third: "It would be a good idea to encourage and recognize meaningful progress and successes. This is difficult to accomplish when the project is not seeing meaningful successes. Also, this is difficult to implement by SCE&G within the bounds of an EPC."

Comments: "The issues being addressed in the observation above are definitely the responsibility of WEC to resolve under the EPC Agreement if impact to the project. The suggestions in the priorities above are good ones and WEC is already taking action since the October 2015 Agreement to improve the E&DCR process such as getting WEC-Cranberry and WEC Construction more involved in the reviews to clean up the backlogged and confusing E&DCR's. However, prior to throwing more engineering resources at the issue as suggested in the priorities above, it would be more effective for WEC to perform a productivity study on their E&DCR process in order to look for road blocks in the process and opportunities to streamline. Again this is WEC's responsibility to resolve under the terms of the Contract, and WEC is at risk due to potential schedule risks caused by design changes, especially if we exercise the fixed option of the October 2015 Agreement." Second: "WEC and WECTEC debt reviewed weekly in POD

21. Push WEC to initiate a focused effort to complete known design "debt" to assist construction planning and to eliminate one source of E&DCRs. Push WEC to establish a forecast based on historical data and staff on a level of effort basis to support. Push WEC to provide additional staffing to address emergent E&DCRs and work off the current backlog. Push WEC to adjust the make-up of the team expertise (civil, piping, electrical, etc.) to support the different stages of construction. Push WEC to locate dedicated WEC engineering response teams to the site with design authority to resolve E&DCR issues. Push WEC to establish a WEC/CB&I "light structures" design organization at the site to work with construction to redesign and reissue piping, HVAC, conduit, and tray supports that have been identified as difficult or impossible to construct (in advance of the construction need date), and to

support the design of field run commodities such and conduit and instrumentation tubing that have yet to be installed.

22. Push WEC to use a Six Sigma approach to simplify the size and content of the work package. Push WEC to strictly enforce within WEC and CB&I design engineering that no more than four change papers against a design drawing may exist before they must be incorporated into the parent document for re-issue to construction.

23. Push WEC to review current processes and resources to determine why plant drawing revision requirements are not being met. Based on the results, push WEC to revise process and/or add resources to ensure that engineering drawings are revised in a timely manner.

WEC committed to 100 drawings per month to clean up confusing E&DCRs. WEC PCC is now on daily POD call to respond to emergent issues (wasn't the case during Bechtel assessment). The emergent E&DCRs are changing their required reviews to make construction review mandatory (GAP 420 procedure workflow)

Comments: "The above are good observations. The follow-up actions to resolve the voluminous work package issue must be dealt with by WEC under the terms of the Contract. WEC and Fluor have issued a new work package procedure in an effort to streamline the work package documentation that should facilitate more streamlined flow of design information to the craft supervision and more timely closure of the work packages. A work package closure metric is being monitored in the POD. However, it is incumbent upon WEC to get out in the field with the craft and observe the process via a productivity type of overview and follow-up with the necessary actions. Electronic work packages should be considered." Second: "Is there a possibility to improve efficiency by going to an electronic process in the field for work package control, update and approval? Issue rugged notebook/laptop pc (under \$500 each) to field crews and use for updates, signoffs, etc. remotely. Would not require picking up work packages at doc control every shift. And would facilitate record keeping and updates." Third: "New work package procedure issued Jan 2016. Work package closure metric being monitored in POD weekly; resources are targeted to start burndown and close packages; new simplified work packages will slow increase because they are easier to close

Comment: "This is the responsibility of WEC under the terms of the Contract. A "clean drawing" initiative has been implemented by WEC. I question whether or not a productivity study has been effectively performed by WEC in the overall design change process to include the revision of drawings. The question as to why so many design changes needs to be addressed and then the actual drawing change process look at more closely for improvement opportunities. A thorough look at the work processes will highlight roadblocks, obstacles and inefficiencies. Again, this is WEC's responsibility to resolve per the Contract. WEC is at risk for schedule delays"

24. Push WEC to initiate a focused effort on planning and review of design, vendor/contractor documents and tolerances to eliminate or have early identification of N&Ds. Push WEC to establish a forecast based on historical data and staff on a level of effort basis to support. Push WEC to adjust the make-up of the team expertise (civil, piping, electrical, etc.) to support the different stages of construction. Push WEC to create/revise the process to enhance coordination between construction, field engineering, and design engineering for N&Ds.

25. Push WEC to update the standard plant 3D model so that it accurately reflects the final design so that it will better support understanding what is in a room that must be constructed. If possible, the 3D model should be put under configuration control so that images and data drawn from it can be relied on. E&DCRs and N&Ds should be rolled into design drawings and the 3D model to reduce the potential for human error in missing a requirement shown on these change documents.

26. Push WEC to assess the practicality of buying new main steam pipe with the correct wall thickness rather than performing counter boring operations in the field and redesign of the stargate anchor, which may require changes to a 'special processes' specification or manual. Push WEC to evaluate if equipment site delivery can be delayed to minimize field equipment protection problems

Comment: "Late N&Ds dealing with supplier and constructability issues have had an adverse impact on the project schedule for the completion of construction activities. WEC has introduced a new procedure in an effort to address these issues, similar to E&DCR issues. However, WEC should perform a productivity review similar to that suggested for the E&DCR process beginning with spending time in the field observing the obstacles being encountered by the craft and craft supervision and pulling the string to include supplier quality, construction quality and design quality. WEC is responsible for addressing these issues according to the terms of the Contract."

Comments: "The WEC Strategic Planning Team is being realigned to work closely with Fluor in facilitating in advance constructability reviews and assessing materials, equipment, design documentation, work packages, restraints such as licensing and other potential holdups to initiating the construction activity. The 3D model is certainly a valuable tool for construction supervision to help plan the work activities but needs to be built upon reliable design information. Electrical and I&C design are potential impacts and needs to be thoroughly assessed to insure support of the construction schedule. WEC does not have a good track record for managing its design shop and needs to perform productivity assessments in an effort to streamline their in house design process. The late procurement and delivery of commodities has been an issue and needs to be factored in the SPT review as well as work packages and design documentation previously discussed. All of these pre-planning efforts are the responsibility of WEC under the terms of the Contract." Second: "SPT and Constructability group being realigned and seconded to Fluor to work on initiatives in this area"

Comments: "The design issues above and the resolution thereof are the responsibility of WEC under the terms of the Contract. WEC is also responsible for equipment in all phases of design, fabrication, delivery, preservation, installation and commissioning. Because of our EPC Contract with WEC, We need to be careful not to get in the middle of making decisions relating to purchasing new Main Steam pipe or delaying the delivery of equipment. If there is

prior to installation in the plant.

27. Push WEC to intensify the efforts of the Strategic Planning Group, work package planning, constructability reviews, etc. to identify design changes needed well in advance of the construction need date. Push WEC to look-ahead beyond where construction is today and work with the site Strategic Planning Group to roll in E&DCRs for all design documents associated with the room being planned, so that the room plan deliverable has the most up to date design documents.
28. Push WEC engineering to continue to stay on top of emergent issues including maintaining focus on the increase in Approved DCPs/Doc Pairs requiring closure. Push WEC to add appropriate staff to work off the backlog of approximately 1,150 of 1,400 items identified on the September 14, 2015 dashboard. Push WEC to complete the identification and resource loading of the post-engineering design closure plan and load activities/resources into the P6 schedule. Push WEC to assess changes to staffing that may be required to support this work. The weekly four hour engineering schedule meeting is a good practice and should continue.
29. Push WEC engineering to get ahead of construction and get E&DCRs incorporated into design drawings so that construction planning is simplified and takes less time. A construction priority should be work package closure. The Strategic Planning Group function should continue because of the issues that have been identified to date with the engineering design drawings. Push

potential that the equipment and systems will not perform per the contractual requirements and impact operations of the Unit, we should challenge WEC as necessary per our contractual rights." Second: "Accomplishing these recommendations would require more TIME and additional delays. Is the saving from accomplishing in a more efficient manner going to make up for the time required to get the designs changed?" Third: "we can look prioritizing SCE&G PMO oversight of this proposed change, not sure what schedule gain it would yield if any"

Comment: "This initiative is underway with GAP 420; SPT needs to be a required reviewer, SCE&G PMO is pushing this already"

Comments: "WEC needs to carefully look at their work processes for addressing design closure and emerging design issues. Additional resources and meetings will not fix the problem which appears to be rooted in the manner in which WEC manages its overall design process. I believe that productivity reviews in the areas of design closure and emerging issues will identify the obstacles that need to be removed in getting the work done in a timely manner. This is WEC's responsibility to address under the terms of the Contract." Second: "PCC tied into POD. Design completion reviewed weekly"

Comment: "Reference to my previous comments in the SMT, work package and design review work processes. The Strategic Planning Team concept can be beneficial to the project, but a more thorough analysis of the work processes needs to be performed via productivity assessments in order to get to the root of the holdups and obstacles. Significant effort needs to be made by WEC management to understand what's going on in the field starting with spending time with

WEC to set up in the field a design engineering "light structures" group to facilitate field walkdowns to support preparing designs for 2" diameter and under support designs, and issue the design drawings.

30. Push WEC to correctly sequence the placement of mechanical and floor modules into Unit 3 CA20 and CA01 modules prior to installing them in the unit.

31. Push WEC to improve the process of conveying status and associated details of issues such that sufficient details are known and can be properly conveyed. Push WEC to establish a coordination meeting for procurement only so that there is a coordinated effort between site and Charlotte procurement activities.

32. Push WEC to expedite the finalization of the surplus process and implement it quickly so that space can be reallocated to incoming material. Consortium management must drive this priority activity, along with Owner input, since space is at a premium.

the craft construction teams. This is WEC's responsibility to address per the terms and conditions of the Contract."

Comments: "The overall module production program has been a major issue for the project. Design issues have contributed to the problem. Efforts are being made by WEC to mitigate additional schedule delays by the setting of CA20 in two major sections. Other resequencing mitigation is being considered by WEC. My comments previously made concerning the efforts needed to improve the WEC design processes hold true for the module program as well. This is WEC's responsibility to address per the Contract." Second: "Recommend review and evaluation of specified tolerances to determine if they are too stringent. Where determined to be so, submit license amendments to remove the tolerance well in advance of construction need dates....EPC limitations limit Owner influence on this." Third: "Have to mitigate CA20 to support critical path (higher priority than floor work)"

Comments: "Material management, to include procurement, storage and preservation, has been a major issue for the project. This issue has been exasperated by the schedule delays due to module fabrication and delivery. Communications among WEC, WECTEC and Fluor need to improve as noted in the observation above. But more importantly, the material management work processes need to be fixed by studying the processes at the grass roots level and implementing productivity improvements. WEC is responsible for addressing this overall issue as necessary to comply with the Contract." Second: "WEC and WECTEC engineering working on alignment, need further oversight"

Comments "space is at a premium due to delays in the project schedule caused by the Consortium. SCE&G will work with WEC to provide space within the site boundaries and SCE&G property outside the site. WEC is responsible for addressing this issue via their planning process. This is WEC's responsibility to address as necessary to comply with the Contract and the October 2015 Agreement." Second: "In a Fluor FAA"

33. Recognizing that this will be a significant time, resource, and logistical issue, push WEC to work to reorganize the laydown yards with a focus on incoming material. Work towards staging by commodity and, where it makes sense, by work package.

34. Push WEC to complete the inventory revalidation effort which is planned for completion by the end of 2015. Push WEC to establish a program to continually validate inventory.

35. For material currently in the Consortium's control, as part of the re-inventory process, have WEC create and attach new tags. Use weather resistant type tags that can be printed onsite. For future shipments, CB&I Laurens must use and attach metal tags instead of paper. It is assumed that a specification change will be needed to facilitate this new method of identification. As part of the re-inventory process, push WEC to validate RFID operability and change accordingly if required.

36. Push WEC to enhance the material storage program such that it is properly monitored and maintained as a joint effort between procurement and construction. Push WEC to reconfirm that all items requiring maintenance are properly included in the material storage program. Push WEC to identify and disposition items that have issues/problems quickly so that if re-placement or repair is required, the replacement properly supports the schedule.

37. Push WEC to expedite the implementation of the identified BPOs so that construction can use them rather than writing individual material requisitions. In developing the "list" of BPOs in place that would support a min/max system, push

Comments: "WEC, working with its subcontractor Fluor is responsible for developing and implementing a material management plan to address the issues above as necessary to comply with the Contract and October 2015 Agreement." Second: "In a Fluor FAA"

Comments: "WEC, working with its subcontractor Fluor, is responsible for overhauling its material management plan to address the observations and recommendations above as necessary to comply with the Contract." Second: "In a Fluor FAA"

Comment: "Material traceability is required for nuclear safety related material under 10CFR50 Appendix B which is also a WEC commitment under the Contract. Tagging must be adequate to support this requirement. Also, proper tagging is necessary for inventory control and to support the timely issuance of material to the field. WEC, working with its subcontractor Fluor, is responsible for material traceability and inventory controls as necessary to comply with the Contract." Second: "In a Fluor FAA. Stainless steel Tags already recommended"

Comment: "Recommend that WEC perform productivity studies on the material management work processes in order to assess, develop and implement an effective overall material management program. WEC, working with Fluor as its subcontractor, is responsible for implementing a material management program to meet their obligations in the Contract." Second: "Consider an evaluation of equipment on-site to determine if any refurbishment is required and work this effort into the schedule. It may seem to be a drastic step, but returning equipment to the mfg. for refurbishment and future storage may be a desired alternative to finding out work is needed after you turn on the power to it." Third: "In a Fluor FAA"

Comments: ") WEC, working with its subcontractor Fluor, is responsible for implementing an effective material management program as necessary to meet its obligations under the Contract." Second: "In a Fluor FAA. Fluor MatMan to be utilized, reported has these functions"

WEC construction and field engineering personnel to help define what products should be maintained within the min/max system. Push WEC to educate site personnel on the use and process of the BPOs and the min/max system.

38. Push WEC to work with construction and establish a "planning tool" such that the two organizations better communicate needs so that requests are not in a continual rush mode of operation. Push WEC to establish a two week look-ahead planning tool. This is needed as material for a given request is most likely in multiple locations with the current laydown yard situation. Push WEC to consider storing material by work package, as this will make withdrawal more efficient and act as a confirmation that all material is on-site and available.
39. Push WEC to continue to analyze work allocation based on current performance, shop loading, and construction schedule needs. Push WEC to confirm the ability of the existing eight module fabricators to support the schedule with the resources, flexibility, and wherewithal to handle the work. Push WEC to complete an analysis of the ROYG report and their associated fabricator and develop a plan to have deliveries made in accordance with the schedule.
40. Push WEC to reconfirm that Purchase Order and/or Contract requirements are clearly and properly stated. Push WEC to re-review with the supply chain their understanding of requirements. Push WEC to monitor for trends and address with supplier management. Push WEC to address the training of individuals reviewing documentation packages to ensure their understanding of the requirements and processes.
41. Push WEC to complete the analysis of ROYG report to properly assess the schedule. Push WEC to ensure proper attention/monitoring is in place. Push WEC to reconfirm the expediting resources available to manage the fabrication Purchase

Comments: "WEC, working with its subcontractor Fluor, is responsible for implementing an effective material management program as necessary to meet its commitments under the Contract. Productivity studies performed by WEC for the work processes dealing with the material requests and withdrawals would be beneficial in achieving this." Second: "2 Weeks is not long enough ahead of time for material planning. Storing material by work package does not support efficient space utilization or material segregation. As an interim step just before needed, this may be beneficial if we had the space to do it." Third: "In a FAA."

Comments: "WEC is responsible for implementing an effective module management plan to fulfill its contractual obligations." Second: "This is a continuing effort and to my knowledge is never finished until the last module has arrived on site. I understand that WEC has taken on this responsibility (post amendment) and it is now properly managed." Third: "WEC Modules group now owns this."

Comments: "The CB&I procurement process is now owned by Fluor as a subcontractor to WEC. WEC ultimately is now responsible for implementing an effective procurement program per the Contract and October 2015 Agreement and, working with Fluor, is charged with the responsibility of making sure that the supply chain PO requirements to the suppliers are clearly delineated and understood. As stated before in other areas, work flow evaluations conducted by WEC in this area would be beneficial." Second: "In a Fluor FAA."

Comments: "I disagree with the observation above in that I do not believe CB&I procurement process inherited by WEC is working as it should. Throwing resources at the problem is not necessarily the solution to the problem. As I have mentioned in earlier comments, a review of the procurement process at the

Orders and improve schedules. Push WEC to improve the efficiency of change management, as it takes too long to resolve issues that will allow completion of fabrication.

42. Push WEC to expedite the resolution of CGD issues so that if the material has to be replaced, it can be in time to support schedule. Push WEC to revalidate the Purchase Orders that have compliance issues so that verification is documented and all material is accounted for. Push WEC to increase the interactions with suppliers to ensure the Purchase Order/specification requirements are understood and CGD is properly supported by the supplier and project engineering.

43. Push WEC to expand/enhance existing tools to accommodate site needs, such that status data can be maintained and available for view by the project. Push WEC to develop a system whereby data management/entry is completed within one system.

44. Confirm the completion of the schedule adherence effort as scheduled by October 31, 2015. Push WEC to evaluate resource needs to properly manage items identified in the ROYG report as impacting construction need dates.

45. Push WEC to adjust work package planning to allow for a "normal" state of operation for the downstream activities after the work package is issued.

46. Since the MAB has a substantial amount of work remaining in addition to the work on Unit 2 CA03, push WEC to develop a resource-loaded schedule

grass root level needs to be performed by WEC and Fluor as its subcontractor to get a grip on what the problems are and how the fix them." Second: "In a Fluor FAA."

Comments: "Commercial Grade Dedication (CGD) of material has been an issue with CB&I's supply chain. It would behoove WEC and its subcontractor Fluor to evaluate the CGD work flow process at the grass roots level, identifying the hard spots, obstacles, and issues. Then work to fix the problem. The recommendations above should be considered in this process. This is WEC's responsibility to resolve per their obligations under the Contract." Second comment: "In a Fluor FAA."

Comments: "I agree that all functions of the procurement system, to include expediting, should be automated via a single system to the extent possible. Fluor, subcontractor to WEC, plans to use Maximo that should have the capability to perform this function. This is a WEC responsibility to address per the Contract." Second comment: "These recommendations will most likely be addressed as Fluor takes over the procurement of commodities. Engineered equipment will continue to be procured by WEC/Wec Tec and not sure what system will be used." Third comment: "Fluor MatMan to address; In a Fluor FAA."

Comments: "WEC and its subcontractor, Fluor, are now responsible for managing the procurement program as a result of the October 2015 Agreement and should be assessing the procurement reporting processes. This is WEC's responsibility per the Contract." Second comment: "Ongoing schedule reconciliation, already happening."

Comment: "Work process studies should be conducted for the work package planning and interface with the procurement system to identify obstacles and communication gaps for getting the work done. This is WEC's responsibility under the Contract."

Comment: "I agree that a study of the work processes should be performed and productivity measures be established. A resource loaded schedule needs to be

and some type of plan to predict and measure performance. Since this is not typical construction work, an example might be jobhours per lineal foot of weld. The development of these tools should help keep the work on schedule and within budget. Since the shop is performing so well, a study should be performed to see what other work they can be perform as they complete module work.

47. The focus of the POD should be on resolution of issues (i.e., engineering, procurement, and quality) impacting the construction activities. Push WEC area construction teams to develop the three week look-ahead schedule and monitor the plan in the area construction meeting, which should not be held more than twice per week. The reason a project of this size is broken down into areas is because it is too big to manage construction from a central group (for example, a PMO). Delegate to the area team the responsibility for cost and schedule. The PMO should provide support to resolve engineering, procurement, and quality issues as needed and integrate all facets of the project.

48. Push WEC to look at streamlining the process for construction aids and material. In addition, look at expanding the min/max program to ensure enough material is continuously maintained to adequately support construction. This would cover items such as stock steel (angles, channels, etc.), fasteners (bolts, nuts, washers, etc.), piping material (studs, gaskets, etc.) and conduit fittings and unistrut.

established based on the anticipated performance rates. The performance should be closely tracked with obstacles identified and removed. Additional work can be factored in the schedule provided that the productivity can accommodate. This is WEC's responsibility to address per the Contract."

Comments: "Meetings can be counter-productive without the proper focus. Field supervision needs to be with their craft teams getting the work done and not in meetings. Management needs to be in the field observing the work in an effort to identifying obstacles holding up the work and making efforts to remove these obstacles so the craft teams can do their job. I have not attended the POD's since the October 2015 Agreement and hopefully these meetings, under the control of WEC and Fluor as its subcontractor, are more productive. Also. The productivity performance of the construction crews should be tracked and used for more effective scheduling and monitoring. All of this is WEC's responsibility to address per the Contract." Second comment: "Project should be broken down into areas small enough for a single point of responsibility for each area and managers should be aware of the work. Management chain should not require field supervision to prepare reports and research issues. This is not the job of field supervision. Area/project managers within the PMO should be capable of preparing their own updates and have a focus area small enough to give them time to do it."

Comments: "The field material requisitioning process needs to be evaluated at the grass roots level per my previous comments. This is WEC's responsibility to address per the Contract." Second comment: "site storage limitations impact min/max programs. Also, the contractor has proven in the past to not be able to effectively manage min/max system. In addition to min/max for standard materials, planners should be ordering the required special materials when the work scopes are planned to get the material on site to support work. Field supervision should review material orders in the work package to validate it is adequate just prior to start of work. As material is

49. Push WEC to determine how much rework is required on the delivered pipe spools and get it done prior to delivery to the installation point.

received, it should be marked for the work package and it should not be removed for any other purpose. Approval authority for FPR's can be delegated to responsible positions."

Comment: "WEC is responsible for addressing this issue per the Contract and is at risk for the costs associated with the rework. In addition, WEC should be assessing root cause of issue which deals with inadequate design. This root-cause evaluation is required of nuclear safety related spools are impacted. In this root cause evaluation, it would behoove WEC to evaluate the design work process at the grass roots level to determine the stumbling blocks causing the problem."

50. A dedicated team of senior subject matter experts from both WEC and CB&I engineers should be engaged to review situations such as the omitted dowels left out of Lift 4 of Unit 2 containment slab placement to ensure that the proposed fix, which will have a significant impact on schedule, is really required. In addition, this team should assist with resolution of critical issues from the time of discovery of the issue to ensure it is resolved with as small an impact to the project as possible.

Comment: "The recommendation above appears to be more directed at the hardware fix which certainly needs to be evaluated to determine schedule impact. More important is why these dowels left out to begin with which would require a close look at the work processes involved in order to determine the cause of the breakdown and actions to prevent recurrence. This Is WEC's responsibility to address per the Contract." Second comment: "PMO organization should address these issues. It is Owner's understanding that a senior group of subject matter experts DID participate in making the decisions"

51. In addition to onsite training, WEC should be encouraged to consider establishing a training school off site (possibly at local vocational schools) to train pipefitters, electricians, and welders to insure they can fill their needs in a timely manner. There are 6 onsite classrooms available which should be used full time to develop those crafts that are presently or will be in short supply. A project-specific labor survey should be performed.

Comments: "The availability of craft resources to complete the project is a major concern. Fluor as a subcontractor to WEC is implementing a staffing plan that will hopefully bring in the necessary craft personnel. This is WEC's responsibility to address per the Contract. WEC is at project schedule risk per the Contract." Second comment: "Off Site training facilities have been developed and used.

The main driver behind the failure to secure proper numbers of craft is failure to properly identify the craft requirements in time to develop the resources. You can't recruit and train the resources needed in the short time periods currently demonstrated by the contractor. Craft labor requirements must be identified at least 6 months out from the need date, rather than the 60 – 90 days currently practiced. At least 12 months is required if significant training is to be expected. The contractor needs to accurately plan the work and determine required resources in a more

52. Push WEC to develop mentoring and training plan to promote junior craft and field engineering personnel with periodic evaluations and feedback sessions. Push WEC to create and staff shadow positions for senior level positions within the Consortium intent on developing new talent that is focused on project completion.

53. In areas of dense rebar, push WEC to use additional consolidation such as standard concrete vibrating or form vibrating to ensure complete consolidation of the concrete.

54. Push WEC to perform an interference review and to resolve any interference found prior to start of installation. Some estimates should be performed to determine whether it is cheaper to install the hanger as designed or redesign the hanger. Once a decision is made, a reforecast should be performed to determine what the real costs would be. Hanger locations need to be located on the drawing using reference lines in the containment.

55. Push WEC to assemble a team of subject matter experts who can meet with field engineering to identify those areas where tolerance increases would help solve installation and interference problems. Examples would include increasing rebar spacing tolerances, increasing pipe location tolerances, etc.

56. Push WEC to assign a team to review and streamline the work package process. One change might be having the responsible field engineer hold the work package and only issue the relevant drawings (and changes) and inspection, hold points, and signoff sheets to the foreman. At a minimum, incorporate the design changes into the construction drawings before the craft start work. (It is time consuming for the foreman to refer to multiply design change documents when trying to execute the work). Remove the specifications and standard details from the packages given the foreman, they can be referenced and copies kept

timely manner.

Comment: "Fluor as a subcontractor to WEC should be addressing this in their staffing plan. WEC is responsible for assuring adequate staffing to complete the project per the Contract."

Comment: "Fluor as a subcontractor to WEC should be considering this recommendation. WEC is responsible for performing quality work and is responsible for the costs and schedule impacts due to rework per the Contract."

Comment: "WEC is responsible for addressing this per the Contract and is at risk from a schedule and cost perspective."

Comments: "WEC should already be evaluating the use of expanded tolerances that would be acceptable in certain instances. WEC is responsible for addressing this per the Contract." Second comment: "Tolerance limits should be investigated to determine the engineering basis for tight tolerance. Many do not represent "normal" construction tolerances and do not appear to be justified."

Comment: "Reference my previous comments on the work package process evaluation for efficiency. WEC is responsible for addressing this per the Contract." Second comment: "Is there a possibility to improve efficiency by going to an electronic process in the field for work package control, update and approval? Issue rugged notebook/laptop pc (under \$500 each) to field crews and use for updates, signoffs, etc. remotely. Would not require picking up work packages at doc control every shift. And would facilitate record keeping and updates. Updates could be "pushed" out to pc's automatically on a routine basis to insure the latest data is in use."

in the field stick file trailers. The work packages should only include what is needed by the foreman for their work.

57. Push WEC to review the electrical quantities in the annex building and turbine building and update as needed. Push WEC to revise the Level 2 and 3 schedules and also the bulk curves to align with the account for the new quantities.

Comment: "Fluor is currently re-estimating the project and should have more accurate estimates of quantities."

58. Ensure that Fluor completes a reforecast based on to date performance, and establish realistic unit rates for the bulk installations. These realistic unit rates times the forecasted quantities will result in better projections of manpower needs by craft needs and craft performance can be monitored. Ensure that Fluor adjusts the rates to take into account present performance impacts such as: work packaging, skill levels, experience of personnel, and 10 CFR 52 licensing requirements.

Comments: "WEC and its subcontractor Fluor are re-evaluating the unit rates. This is WEC's responsibility to address per the Contract." Second comment: "Fluor is re-estimating the project to determine more accurate manpower projections and performance measurements. Updated data is expected in August 2016 and baselines will be updated at that time."

59. Ensure that Fluor develops a craft staffing plan to reduce the indirect costs and staffing to a reasonable level. It should be monitored weekly just like direct work. A reforecast should also be performed along with a revised equipment plan.

Comments: "WEC and its subcontractor Fluor are evaluating the staffing plan for direct craft and indirect craft labor. They should also be reviewing their equipment plan. Fluor is in the process of developing a resource loaded project schedule which they indicate will be finalized in third/fourth quarter 2016. The key to the staffing plan will be reliable performance factors and labor ratios for the craft personnel. WEC is responsible for this effort per the Contract and is at risk due to schedule impacts in addition to cost impacts if we select the October 2015 Agreement fixed option." Second comment: "Fluor is re-estimating the project to determine more accurate manpower projections and performance measurements. Updated data is expected in August 2016 and baselines will be updated at that time. Unfortunately, with the extremely large quantity of material and equipment on the main site and at remote facilities, there will be an inordinate quantity of Indirect Craft required to operate warehouses and maintain permanent plant equipment. This will cause an unusual I/D craft ratio to persist for some time."

60. Ensure that Fluor performs an evaluation of why the turnover in non-manuals is so high. Areas to investigate would include the demand to work excessive overtime, conflicting management

Comments: "Fluor's influence on the project as a subcontractor to WEC should stabilize the construction management and field non-manual turnover rate

direction, or the micromanagement of personnel. The resolution of some of these potential issues would help reduce the turnover of the non-manual workforce.

61. Have Fluor consider whether the work week should be reduced to no more than 48 hours (4-10s and 1-8 hours). With the monies saved not working as much overtime, consideration should be given to a craft incentive plan that rewards staying on the project until given a reduction in force, and/or productive and safety incentive. To reduce the turnover, suggest that Fluor consider a craft incentive of \$1/hr which would only be paid when a reduction in force occurs.
62. Have Fluor consider whether to staff up to allow working of all available work areas. Fluor should consider leaving craftsmen assigned to one area so they feel they are part of an area team. It may be appropriate to combine the Unit 2 and Unit 3 containment to better use non-manuals and make some personnel available to fill other project needs. This would allow better incorporation of lessons learned by both non-manuals and craftsmen in Unit 2 to improve Unit 3 performance and schedule.
63. Have Fluor re-evaluate the staffing levels based on historical data and ensure there are crafts budgeted for punchlist completion.

because of Fluor's experience building large capital projects over the many years. Fluor is also planning to reduce the ration of field non-manual to direct craft in an effort to be more efficient and cost effective in the field non-manual support area. However, this is WEC's responsibility to address per the Contract." Second comment: "Problems run deep with the previous Contractor...Fluor is expected to resolve these issues, however it will take time and consistent demonstration of management stability for this to occur."

Comment: "Fluor as a subcontractor to WEC should be evaluating these issues in their staffing plan. WEC is responsible for providing adequate staffing to complete the project per the Contract."

Comments: "Fluor as a subcontractor to WEC is resource loading the project schedule and developing their staffing plan to hopefully provide efficient work streams to include having available adequate resources and using them efficiently. WEC is responsible for this per the Contract." Second comment: "The main driver behind the failure to secure proper numbers of craft is failure to properly identify the craft requirements in time to develop the resources. You can't recruit and train the resources needed in the short time periods currently demonstrated by the contractor. Craft labor requirements must be identified at least 6 months out from the need date, rather than the 60 – 90 days currently practiced. At least 12 months is required if significant training is to be expected. The contractor needs to accurately plan the work and determine required resources in a more timely manner."

Comments: "Fluor as a subcontractor to WEC is re-evaluating the staffing plan. WEC is responsible for adequate staffing to support the project per the Contract." Second comment: "Contractor needs to resource load the schedule based on reasonable unit rates and set performance goals and schedules based

64. Have Fluor assess whether the safety department should simplifying the tailgate write-up so it could be easier to understand and retain. (For example, the September 25, 2015 tailgate topic on chemical labeling was perhaps too complex.) At the daily morning safety briefing, each craftsman is required to sign the morning bulletin. This probably takes 15 minutes for the crew to sign the bulletin which is 15 minutes the craft is not at the work face. Have Fluor re-evaluate the need for signatures.

65. Have Fluor evaluate the schedule for the bulk installation of commodities to allow enough time between work activities to achieve an efficient and cost effective installation program.

66. Have Fluor evaluate whether the project needs to staff up to work all available work faces. Have Fluor consider whether a senior construction person should be assigned to evaluate methods to have the craftsmen spend more time at the workplace (One example: move the tool boxes into the building near the work area.) Have Fluor assess whether coffee breaks and lunch should be taken in the work areas.

67. Have Fluor assess whether mandatory constraints should be removed, and allow the schedule to move based on the logic. Assess how to prioritize development of mitigation/recovery plans based on their potential impact to the schedule. Consider only incorporating mitigation plan recovery into the schedule after it has been fully developed and approved by all parties.

68. Have Fluor consider updating the forecast based on recent performance. Have Fluor consider reassessing manpower needs based on updated

on the realistic information."

Comment: "Fluor as a subcontractor to WEC should be looking for ways to make this process more efficient. WEC is responsible for the project safety program per the Contract."

Comments: "Fluor as subcontractor to WEC is evaluating the commodity installation work flow and schedule. WEC is responsible for addressing this per the Contract." Second comment: "Contractor needs to resource load the schedule based on reasonable unit rates and set performance goals and schedules based on the realistic information. Overly aggressive and optimistic schedule dates are not the best way to encourage craft labor performance. This has been demonstrated by the repeated failure of the contractor to meet published schedule dates for project milestones."

Comment: "As stated in my previous comments, WEC and its subcontractor Fluor should be performing productivity studies at the grass roots level in practically all work processes to identify and eliminate the obstacles for getting the work done. WEC is responsible for addressing this per the Contract."

Comments: "WEC is responsible for the schedule per the Contract." Second comment: "Do we want to allow the schedule to run out to actual dates with the mitigations removed?"

Comments: "Reference my previous comments pertaining to productivity studies at the grass roots

forecast. Implement a small sample of piping and electrical work packages well ahead of bulk installation period to assess potential impacts early. Plan to ramp-up slowly, gradually, to achieve an acceptable productivity level, train leads, and identify challenges and impediments prior to ramping up to full bulk installation mode.

69. Have Fluor analyze the schedule to identify activities within the critical and near critical paths that contain potential float. At the time of rebaselining the schedule, a schedule contingency analysis should be run and the desired probability of outcome should be agreed on.
70. Have Fluor consider only using a standard "S" shaped work-off curve when evaluating the schedule duration viability.
71. Have Fluor consider creating a new, more achievable, baseline Level 3 schedule. During development of the schedule, have Fluor ensure appropriate time is allocated for bulk installation windows. Have Fluor update the schedule forecast based on the median range of achievable peak sustained rates. Review quantities by system, and align to the schedule and start-up system waterfall. Prioritize bulks by system turnover demands. Balance this priority with area releases, and methods that would allow the highest productivity to be achieved. Compare system driven quantity curve against peak sustained rate forecast, and adjust accordingly. Plan work packages around the most productive methods of bulk installation (e.g., cable trees), with consideration for ability to support system turnovers.
72. Have Fluor adjust the Level 1 schedule to include a time-scaled baseline and target and forecast dates for all identified activities. Expand the start of the window schedule to show major project status since project inception. Create a Level 3 control schedule with no more than 5,000 activities per unit. The Level 2 schedule can be used at a starting point, but would need to be converted to "task"

level. WEC is responsible for addressing this per the Contract." Second comment: "Contractor needs to resource load the schedule based on reasonable unit rates and set performance goals and schedules based on the realistic information. Overly aggressive and optimistic schedule dates are not the best way to encourage craft labor performance. This has been demonstrated by the repeated failure of the contractor to meet published schedule dates for project milestones."

Comments: "Fluor as a subcontractor to WEC is re-evaluating the project schedule. WEC is responsible meeting the schedule per the Contract." Second comment: "Do we want to allow the schedule to run out to actual dates with the mitigations removed?"

Comment: "This will impact SCD due to unreasonable commodity installation rates (even more so than currently scheduled)"

Comment: "This will impact SCD due to unreasonable commodity installation rates (even more so than currently scheduled)"

Comments: "Fluor as subcontractor to WEC is re-evaluating the project schedule to include resource loading. WEC is responsible for the project schedule per the Contract."

activities as opposed to “hammock activities”. The Level 3 schedule should be at a sufficient level of detail to identify all critical interfaces between each phase of the project. The recommended structure is to identify construction activities by unit, building, elevation, area, and commodity. A custom data field should be added to identify systems associated with each activity, to ensure proper tie in from construction to startup. This schedule should be resource loaded with key quantities and job hours and maintained/aligned to the current forecast for the project. Weekly meeting and management reviews should use this Level 3 schedule as opposed to lower level schedules. Develop more detailed Level 5 implementation schedules as needed to manage near term commitments for critical areas. These can be in Excel rather than Primavera, and in addition to time-scaled format, can be in the form of a bingo-sheet, checklist, or other method to track status. Primavera is currently over-used for this level of the schedule, demanding more maintenance, update, meetings, etc., that strain project resources.

73. Have Fluor reexamine construction terminations per cent complete compared to BIP turnovers and adjust the project schedule accordingly.

Comment: “Fluor as subcontractor to WEC is evaluating the project schedule. WEC is responsible for meeting the project schedule per the Contract.”

74. Provide data and documents to support the Owner’s program development for system turnover and operations. (WEC)

No comments

75. Provide Electromagnetic Capability (EMC) with protection and safety monitoring system. (WEC)

No comments

76. Provide onsite automation support to Owner during post initial core load. (WEC)

No comments

77. Provide Plant Security System (SES) testing. (WEC)

No comments

78. Provide Cyber Security for all site specific systems to include connections between the MET Tower and Control Room. (WEC)

No comments

79. Resolve documentation inconsistencies among the main step-up transformers, reserve auxiliary

transformers and unit auxiliary transformers.
(WEC)

No comments

80. Produce a project schedule plan to achieve
construction completion of at least 3% per month.
(WEC & Fluor)

No comments

81. Take necessary action to resolve the storage and
preventive maintenance via the CAP – reference
NND-16-0077. (WEC & Fluor)

No comments

Crosby, Michael

From: Pelcher, Steve
Sent: Wednesday, September 28, 2016 2:20 PM
To: BYNUM, ALVIS J JR; Wenick, George (gdwenick@smithcurrie.com)
Cc: Baxley, Mike; Warner, Elizabeth; Carter, Lonnie; Marsh, Kevin B.; Crosby, Michael
Subject: Redacted - Privileged

Redacted-Privileged

Thanks.

Steve

From: Pelcher, Steve
Sent: Friday, August 19, 2016 8:43 AM
To: BYNUM, ALVIS J JR
Cc: Wenick, George (gdwenick@smithcurrie.com)
Subject: The Santee Cooper Board Meets on Monday, August 22nd
Importance: High

Redacted-Privileged

Thanks.

Steve

Stephen R. Pelcher | Deputy General Counsel Nuclear and Regulatory Compliance
 Santee Cooper | srpelche@santeecooper.com
 Physical: One Riverwood Drive, Moncks Corner, SC 29461
 Mailing: PO Box 2946101, M-402, Moncks Corner, SC 29461-6101
 Office: (843) 761-4016 | Mobile: (843) 834-4466

From: Pelcher, Steve
Sent: Thursday, June 30, 2016 4:08 PM
To: 'BYNUM, ALVIS J JR'
Subject: RE: [EXTERNAL SENDER] RE: Follow Up from our Email Exchange of late last week on project bankruptcy country

Redacted-Privileged

From: BYNUM, ALVIS J JR [<mailto:ABYNUM@scana.com>]

Sent: Thursday, June 30, 2016 2:59 PM

To: Pelcher, Steve

Subject: RE: [EXTERNAL SENDER] RE: Follow Up from our Email Exchange of late last week on project bankruptcy country

Redacted-Privileged

From: Pelcher, Steve [<mailto:stephen.pelcher@santeecooper.com>]

Sent: Thursday, June 30, 2016 2:58 PM

To: BYNUM, ALVIS J JR <ABYNUM@scana.com>

Subject: Re: [EXTERNAL SENDER] RE: Follow Up from our Email Exchange of late last week on project bankruptcy country

***This is an EXTERNAL email. Please do not click on a link or open any attachments unless you are confident it is from a trusted source.

I noticed Lonnie is not physically here.

Redacted-Privileged

On Jun 30, 2016, at 2:54 PM, "Pelcher, Steve" <stephen.pelcher@santeecooper.com> wrote:

3pm. 6 minutes from now. I am in Board Room.

On Jun 30, 2016, at 2:53 PM, "BYNUM, ALVIS J JR" <ABYNUM@scana.com> wrote:

What time is the meeting?

From: Pelcher, Steve [<mailto:stephen.pelcher@santeecooper.com>]

Sent: Thursday, June 30, 2016 11:41 AM

To: Wenick, George (gdwenick@smithcurrie.com) <gdwenick@smithcurrie.com>;

BYNUM, ALVIS J JR <ABYNUM@scana.com>

Cc: Baxley, Mike <mike.baxley@santeecooper.com>; LINDSAY, RONALD

<RONALD.LINDSAY@scana.com>; Gillians, Shawan

<shawan.gillians@santeecooper.com>; Warner, Elizabeth

<elizabeth.warner@santeecooper.com>

Subject: Follow Up from our Email Exchange of late last week on project bankruptcy country

***This is an EXTERNAL email. Please do not click on a link or open any attachments unless you are confident it is from a trusted source.

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Redacted-Privileged

Thanks.;

Steve

-----Original Message-----

From: BYNUM, ALVIS J JR [<mailto:ABYNUM@scana.com>]

Sent: Friday, June 24, 2016 1:53 PM

To: Pelcher, Steve

Cc: LINDSAY, RONALD; Baxley, Mike; Wenick, George (gdwenick@smithcurrie.com);

Gillians, Shawan; Warner, Elizabeth

Subject: [EXTERNAL SENDER] Re: Follow Up to Action Item from June 20th Joint Board Meeting (Project Bankruptcy Counsel)

Redacted-Privileged

Sent from my iPhone

On Jun 23, 2016, at 5:12 PM, Pelcher, Steve

<stephen.pelcher@santeecooper.com<<mailto:stephen.pelcher@santeecooper.com>>>

wrote:

***This is an EXTERNAL email. Please do not click on a link or open any attachments unless you are confident it is from a trusted source.

Redacted-Privileged

Redacted-Privileged

Steve

From: Carter, Lonnie
Sent: Friday, June 17, 2016 5:12 PM
To: MARSH, KEVIN B
Cc: BYRNE, STEPHEN A; ARCHIE, JEFFREY B; LINDSAY, RONALD; BYNUM, ALVIS J JR;
ADDISON, JIMMY E; Crosby, Michael; Baxley, Mike; Pelcher, Steve; Cherry, Marion
Subject: Re: [EXTERNAL SENDER] Monday's Santee Board Meeting

Kevin,

At today's Santee Cooper Board meeting several questions regarding the implications of a Toshiba bankruptcy came up. Some we could address others not. I would anticipate similar questions Monday. Otherwise, the list below should cover what will come up.

See you Monday. Please call if you wish to discuss anything before the meeting.

Thanks,
Lonnie

Sent from my iPad

On Jun 16, 2016, at 7:20 PM, Carter, Lonnie

<lonnie.carter@santeecooper.com<<mailto:lonnie.carter@santeecooper.com>>> wrote:
Thank you for proposing an agenda for our joint board meeting on June 20th.<x-apple-data-detectors://0> Your agenda appears to address in a very broad way the matters of concern to the Santee Cooper Board and no doubt the SCANA board as well. Our Board is meeting today and tomorrow. I let you know if anything unexpected comes up.

For example, Item No. 1 - "Follow-up on issues from our last joint meeting" - - - this topic is expansive enough to include the project management issues that the joint boards discussed on March 21<x-apple-data-detectors://1>st<x-apple-data-detectors://1>, including implementing the specific set of prioritized recommendations our management team had assembled. I anticipate that the Santee Cooper will want to hear about the specific and detailed progress that has been made in implementing these recommendations that has elapsed between the two joint board meetings.

As to Item No. 2 - "Consideration of the fixed price option" - - the Santee Cooper looks forward to hearing the recommendation of SCE&G management on this issue, having previously heard from Santee Cooper's internal staff and outside consultant on June 17<x-apple-data-detectors://2>th<x-apple-data-detectors://2>.<x-apple-data-detectors://2> Based on our previous discussions, I had anticipated that SCANA could provide a recommendation or conclusion in letter form that the fixed priced option is likely the least costly.

Shifting to the question of precisely when the Santee Cooper will act on the Fixed Priced Option, I will note that a meeting to formally approve the option has not yet been scheduled. No action will be taken at the June 20<x-apple-data-detectors://3>th<x-apple-data-detectors://3> meeting. With that said, we appreciate SCE&G's desire that Santee Cooper act on this matter prior to July 1<x-apple-data-detectors://4>st<x-apple-data-detectors://4> and should be able to accommodate the timing.

As to Item No. 3 - "Update on the milestone schedule/Dispute Resolution Board (DRB) issue" - - is a matter of utmost importance to the Santee Cooper board and management. I suggest anticipating questions that may arise about delays in getting the Dispute Resolution Board stood up and in business. The fact that the Amended and Restated Dispute Resolution Board Agreement and a form of a DRB Member Agreement have not been finalized and executed is a matter of considerable anxiety at Santee Cooper given the time that has elapsed since the October 2015 Amendment was executed and perceived foot dragging by Westinghouse. In addition, anxious to hear that that 'our case' on the milestone payment schedule issue for the DRB is well underway to completion, and that it is compelling. Getting the milestone payment schedule right is critical to the success of the project.

Finally, I agree with you that further staff level discussions on the ramifications of a Toshiba or Westinghouse bankruptcy would be useful and should precede any formal presentations to our boards on this matter. With that said, the possibility of such a bankruptcy cannot be entirely divorced from our joint board discussions on Monday. For example, Item No 2 on your agenda relating to the fixed price option obviously shifts risk away from the Owners and to Toshiba/Westinghouse, making their credit worthiness all the more important. Similarly, with respect to Item No. 3, getting the milestone payment schedule right will make it less likely that Westinghouse view as desirable a strategic Chapter 11 bankruptcy to rid themselves of uneconomical executory contract.

Please feel free to call me if you want to discuss this matter further. My Board meeting should be over after 2:00 tomorrow. I will be available over the weekend also.

Thanks,
Lonnie

Sent from my iPad

On Jun 16, 2016, at 3:39 PM, MARSH, KEVIN B
<KMARSH@scana.com<<mailto:KMARSH@scana.com>>> wrote:
Lonnie,

I know that we have both been out of the office, and that has obviously affected our ability to coordinate for next Monday's Santee Cooper board meeting. However, I have now had a chance to speak to my team about the most effective way to utilize the short two hour time period on Monday.

Based on our internal discussions, we propose an agenda as follows:

1. Follow-up on issues from our last joint meeting;
2. Consideration of the fixed price option; and
3. Update on the milestone schedule/Dispute Resolution Board (DRB) issue

I know that some other topics have been mentioned. However, with only a two hour window, I think that we need to focus on the three topics above, and specifically the fixed price option. I want your board to understand our evaluation process of the fixed price option so they are comfortable voting on its approval.

As we discussed, my understanding is that at the conclusion of this meeting, or before July 1st when our testimony on the fixed price option is due to the SC Public Service Commission, your board will vote on the fixed price option (subject to approval by the Commission).

In a recent email from Mike Crosby there was a request for a "recommendation letter" from us on the fixed price option. I recall in one of our discussions that we would provide bullet points of our evaluation process and results that would be the basis of our testimony on this matter at the Commission. That information will be covered in our presentation on Monday, but not in the form of a recommendation letter. I am confused about the request for a recommendation letter because I don't recall providing one to you for any other board action.

Through a number of emails I have seen other topics that your board may want to discuss. We are prepared to do that, but we believe that such a discussion should occur when we have more time. Issues, such as the potential bankruptcy of Toshiba or Westinghouse are critical, but would prefer to have some detailed discussions and debate within our project teams before making a formal presentation to either of our boards.

I hope your board meetings are going well! We look forward to a productive meeting on Monday.

Kevin